Space Weather Forecast

Issued on Thursday 12 December 2024 at 12:03 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Minor/Moderate (R1/R2) radio blackouts likely.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity has remained Moderate, peaking with a mid-ranking Moderate-class X-ray flare at 11/1549UTC from now-departed region which is now nearing 20 degrees behind the western solar horizon.

There are now up to five sunspot regions on the Earth-facing side of the Sun, with a new small magnetically bipolar region having developed in the southeas. The two main sunspot groups at present are in the southwest and north-central part of the Sun. Both regions have shown recent growth in their central portions.

Two small 'filaments' (arcs of plasma) lifted off the Sun almost in tandem at 12/0930UTC - firstly the far northern end of the series of filaments along 060W (at 15N), and secondly from near S20W040 - with imagery for both pending. With this possible exception, no Earth-directed Coronal Mass Ejections (CMEs) were observed in the period, with activity generally confined to the far side (perhaps of note in roughly a week's time should these larger regions survive to cross the eastern solar horizon onto the front side).

Solar Wind / Geomagnetic Activity: Solar winds showed an ongoing slow regime. The solar wind speed showed a slight decline within background levels, and both the number of particles and their associated magnetic field were unremarkable within background levels.

The net result of the above solar wind measures was provisionally quiet geomagnetic activity throughout.

Energetic Particles / Solar Radiation: No solar radiation storms were observed, despite the potentially generative Moderate-class X-ray flare from a nominally prone location (those emitted near the western solar horizon can connect more fully with the Earth).

Four-Day Space Weather Forecast Summary

Solar Activity: Isolated Moderate-class flares are likely throughout the period, with a slight chance of Strong-class flares.

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Solar Wind / Geomagnetic Activity: There are no confirmed Earth-directed CMEs, with haloes (rings of ejected CME material) identified on imagery as being tied to events on the far side.

Slow wind conditions are now expected until a coronal hole fast wind arrives on Day 3 into Day 4 (between the UTC weekend days - 14 into 15 December). Geomagnetic activity is expected to start mostly quiet as a result, rising to a peak slight chance of G1 over the UTC weekend.

Energetic Particles / Solar Radiation: No solar radiation storms are expected, with a slight chance of rising in response to any notable flares.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	5	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	Yes	60	60	65	65
Very Active	R3-R5 (X Class)	No	5	5	5	5

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	10	5	5	10
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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